

AMERICAN TWO-WINGED FLIES OF THE GENUS MICROPTHALMA MACQUART, WITH NOTES ON RE- LATED FORMS

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Flies of the genus *Microphthalma* have been reared many times as parasites of larvae of May beetles of the genus *Phyllophaga*. They are undoubtedly of great economic importance. A recent examination of the literature and of the United States National Museum collections has shown that a considerable degree of confusion exists in the identification of specimens. It therefore seemed advisable to publish the results of these studies.

Genus MICROPTHALMA Macquart

Microphthalma MACQUART, Dipteres exotiques, vol. 2, pt. 3, 1843, p. 241.—
COQUILLET, Revision of the North American Tachinidae, 1897, p. 138.—
ADAMS, in Williston's Manual, 1908, p. 376.—CURRAN, Ent. News, vol. 36,
1925, p. 15.

Eumicrophthalma TOWNSEND, Insecutor Inscitiae Menst., vol. 3, 1915, p. 97.
Perua TOWNSEND, Proc. U. S. Nat. Mus., vol. 43, 1912, p. 364.

The type and sole original species is *nigra* Macquart; the type and sole species of *Eumicrophthalma* is *shannoni* Townsend; and that of *Perua* is *cuzcana* Townsend.

The type species *nigra* has heretofore been supposed to be a synonym of *distincta*. As explained farther on, I identify this as a separate species, differing slightly in the form of the antennae and in the presence of ocellar bristles from *distincta*. This modification brings *Microphthalma* so close to *Perua* that the latter must apparently become a synonym. The occasional presence of small ocellars in *Microphthalma michiganensis* would seem to prevent the recognition of the ocellars as a generic character in this group, while the other characters appear to be strictly of specific importance. If there are two genera here, *Eumicrophthalma* should be extended to cover *distincta*, *michiganensis*, and *flaviceps*, as well as *shannoni*; in this case *Microphthalma* will cover *nigra*, *cuzcana*, and *townsendi*. I do not favor this division.

The genus forms a typical case of Brauer's character of the vibrissal angles narrowing the clypeus, as the vibrissae are close together and high up, only a little below the middle of the head in profile, while the median space below them is greatly narrowed for a considerable distance. Antennae rather short and resting in a depression; arista bare or slightly pubescent. The parafacials have scattered distinct short hairs. Eye very small, so that there is an enormous area below it, bare and usually concave, the cheek or bucca at least equal to the eye in height. Head moderately long above but short at the oral cavity, the profile receding, especially below the vibrissae. Proboscis small, palpi rather small. The wing has a strikingly long stump at the bend of the fourth vein, and the first posterior cell is open, ending before the tip of the wing. Veins bare except for a few hairs at base of the third vein.

Related American genera, as far as represented in the National Museum, may be tabulated as follows:

KEY TO AMERICAN GENERA RELATED TO MICROPHTHALMA

1. Fourth vein straight beyond the hind cross vein, with distinct stump or branch at the bend; discal bristles absent..... 2
Fourth vein curved backward beyond the hind cross vein, with rounded V-shaped bend and no branch..... 4
2. Arista plumose (type *caninum* Fabricius)..... **Dexiosoma** Rondani.
Arista bare or pubescent..... 3
3. Abdominal sternites bearing clusters of spiny bristles (type *rufiventris* Macquart)..... **Megaprosopus** Macquart.
Abdominal sternites without spiny bristles (type *nigra* Macquart),
Microphthalma Macquart.
4. Front not prominent, head lenticular in shape (type *opaca* Townsend),
Megapariopsis Townsend.
Front prominent, nearly horizontal (type *mexicana* Brauer and Bergenstamm,
synonym of *calogaster* Bigot)..... **Macrometopa** Macquart.

I have redescribed the genotypes of *Megaprosopus* and *Macrometopa* in *Annals of the Entomological Society of America* (vol. 17, 1924, p. 211).

KEY TO SPECIES OF MICROPHTHALMA

1. Third antennal joint black, usually reddish at base about to the arista... 2
Third antennal joint red, sometimes slightly infuscated at tip..... 4
2. Small cross vein not infuscated, wings hyaline (Peru).... **cuzcana** Townsend.
Small cross vein infuscated, wings decidedly clouded basally..... 3
3. Tip of first antennal joint produced above into a scale projecting over and beyond the base of the second joint (Guatemala to New Mexico)
..... **nigra** Macquart.
Tip of first antennal joint not produced (Peru)..... **virens**, new species.
4. With only two sternopleurals; smallish, rather slender species, front of head wholly red..... **ruficeps**, new species.
With three sternopleurals..... 5
5. Abdomen with silvery or white crossbands on basal third or half of segments 2, 3, and 4, the remainder of the segment more polished black, contrasting (U. S., widespread)..... **disjuncta** Wiedemann.
Abdomen entirely pollinose, not with contrasting crossband..... 6

6. Scutellum with three pairs of lateral bristles; large species, 12 to 13 mm. long (U. S., widespread)----- *michiganensis* Townsend.
 Scutellum with two pairs of lateral bristles; small species, 6 mm. long
 ----- *shannoni* Townsend.

MICROPHTHALMA NIGRA Macquart

Microphthalma nigra MACQUART, Dipteres exotiques, vol. 2, pt. 3, 1843, p. 242.—
 WILLISTON, Trans. Amer. Ent. Soc., vol. 13, 1886, p. 306.

Microphthalma sordida GIGLIO-TOS, Boll. real. Univ. Torino, vol. 8, No. 147,
 1893; Mem. Accad. Sci. Torino, ser. 2, vol. 44, 1894, p. 63.

Microphthalma pruinoso COQUILLET, Canad. Entomologist, vol. 34, 1902, p. 200.

The original locality was "North America." Giglio-Tos described *sordida* from Toluca, Mexico, not far west of Mexico City. Coquillett described *pruinosa* from New Mexico and Chihuahua. For Davis's reference to *pruinosa*, see *michiganensis*.

Both the second and third antennal joints are longer in the males than in the other species; the first joint is produced in a scale as noted in the key, and the third joint becomes black just beyond the arista. Ocellar bristles are present in all specimens examined.

The material in the National Museum comprises 12 specimens including type and paratype of *pruinosa*; the others are from Hell Canyon, Manzano National Forest, New Mexico (Townsend); Cloudcroft, New Mexico (W. Knaus); Mount Lemon, Santa Catalina, Arizona, 7,800 feet (collector unknown, the specimen belongs to the American Museum of Natural History); Coapa, Federal District, Mexico, and Atzacapo, Mexico (E. G. Smyth); and Volcan Santa Maria, Guatemala (Schaus and Barnes).

Twelve additional specimens were later collected by the writer on the Polochic River near its head, Alta Vera Paz, Guatemala, May 25, 1926. The species was very abundant, and only lack of time prevented the collection of a still larger number.

Length, 9.4 to 11.4 mm.

Macquart mentioned the color of the antennae very clearly, which apparently fixes his species.

MICROPHTHALMA DISJUNCTA Wiedemann

Tachina disjuncta WIEDEMANN, Abalecta Ent., 1824, p. 45; Auss. Zweifl. Insekten, vol. 2, 1830, p. 295.

Mitogramma trifasciata SAY, Journ. Acad. Nat. Sci. Phila., vol. 6, 1829, p. 174; Complete Works vol. 2, p. 365.

Trixa apicalis WALKER, List Dipterous Ins. in Brit. Mus., vol. 4, 1849, p. 699.

Tachina trixoides WALKER, List, etc., vol. 4, 1849, p. 760.

Microphthalma disjuncta COQUILLET, Revis. Tachinidae, 1897, p. 138.—AUSTEN, Ann. and Mag. Nat. Hist., vol. 19, 1907, p. 327 (syn. of *apicalis*).—ADAMS, in Williston's Manual, 1908, p. 370, fig.—TOWNSEND, Muscoid Flies, 1908, p. 54.—ALDRICH, Annals Ent. Soc. America, vol. 8, 1915, p. 82.—DAVIS, Bull. Illinois Nat. Hist. Survey, vol. 13, 1919, p. 78.—GREENE, Proc. U. S. Nat. Mus., vol. 60, 1922, p. 11, fig.

This is a widespread and fairly abundant insect in North America, the larvae being parasitic on those of the May beetles, various species of *Phyllophaga*. It was originally described from "North America"; *trifasciata* was from Indiana; *apicalis* was published without locality; *trivoides* was from Georgia. Coquillett reported *disjuncta* from New Hampshire to Georgia, Texas, and California, but no doubt included specimens of *michiganensis*.

Major Austen has recently assured me, from a reexamination of Walker's types, that *apicalis* and *trivoides* belong here rather than to *michiganensis*.

The species is recognized by the banded abdomen, the apical half or more of segments 2, 3, and 4 being black, while the base is silvery pollinose. Specimens from the Southwest (New Mexico and Arizona) have a little wider pollinose bases than most of the eastern. Townsend had labeled this form in the collection as *vibrissata* Van der Wulp. I thought at first it might be a distinct species, then only a subspecies, and finally concluded that some of the eastern specimens are just about as pollinose as these and gave up designating them by a special name. In these, rather more conspicuously than in the eastern specimens, there is a tendency for the mesothoracic pollen to be brown in the female and pure gray in the male.

Material in the National Museum consists of 47 specimens: South Windsor, Connecticut (Riley collection); Harrisburg, Pennsylvania, and vicinity (Walton); Pittsburgh, Pennsylvania (Klages); Virginia Beach, Virginia (Knab); White Springs, Florida (Townsend); Utica, Mississippi; Lafayette, Indiana (Aldrich); St. Joseph, Illinois (Malloch); Leroy, Illinois (Riley collection); Opelousas, Louisiana (Pilate); Texas; Onaga, Kansas (Crevecoeur); Manitou Park, Colorado (F. H. Snow); Las Cruces, New Mexico (Townsend); Pecos, New Mexico (Cockerell); El Porvenir, Pecos National Forest, New Mexico (Townsend); Las Vegas, New Mexico (Barber); Hell Canyon, Manzano National Forest, New Mexico (Townsend); East Verde River, Arizona (Townsend); Botfly Canyon, Pinal Mountains, Arizona (Townsend); Sabino Basin, Santa Catalina Mountains, Arizona (Townsend).

Length, 8.7 to 14 mm., mostly over 11 mm.

MICROPHTHALMA MICHIGANENSIS Townsend

Megaprosopus michiganensis TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, 1892, p. 111; Muscoid Flies, 1908, p. 54.

Microphthalma phyllophagae CURRAN, Entomological News, vol. 36, 1925, p. 16.—PETCH and HAMMOND, 55th Report Ent. Soc. Ontario, 1925, p. 25.

Microphthalma pruinosa DAVIS, Bull. Illinois Nat. Hist. Survey, vol. 13, 1919, p. 79.

Coquillett included this species in *distincta*. Mr. Curran has notified me of the synonymy of *phyllophagae*, having seen the type of *michiganensis* after the publication of his species. It was this species and not *nigra* which Davis mentioned (as *pruinosa*) as being widespread in the eastern United States, reared from *Phyllophaga anxia*. I am responsible for the misidentification.

The species differs from *distincta*, with which it is often confused, by the characters of the key, and by hardly anything else. On the pollinose pattern of the abdomen it can be separated quite readily, as shown by the considerable series of both in the collection.

The United States National Museum contains 18 specimens of *michiganensis*, as follows: Six paratypes of *phyllophagae*, all from Hemmingford, Quebec (G. H. Hammond); 2 from Beverly, Massachusetts (Riley collection); 2 from District of Columbia, bred from larvae of *Phyllophaga arcuata* (Pergande Nos. 2932 and 5163); one Plummer Island, Maryland (D. H. Clemons); one Hagerstown, Maryland (W. E. Pennington, bred from *Phyllophaga*); 3 Lafayette, Indiana (Aldrich); 2 Brookings, South Dakota (Aldrich); one Victoria, Texas (W. E. Hinds). The Quebec material was bred from *Phyllophaga anxia*.

Length, 9.5 to 13 mm.

MICROPHTHALMA SHANNONI Townsend

Eumicrophthalma shannoni TOWNSEND, Insector Inscitiae Menstruus, vol. 3, 1915, p. 98.

The single female type specimen from Eastern Branch, District of Columbia, is the only one as yet known. The front is 0.41 of the headwidth, as compared with 0.36 in the female of *nigra*, genotype of *Microphtalma*. The third antennal joint is red, but toward the apex the edge is blackened. The palpi are relatively somewhat smaller than in *nigra*, but not otherwise peculiar. The first posterior cell is open, not closed as the description states. The abdomen is covered with thin pollen, through which the black ground color appears in some lights to be subshining, with only a narrower deeper pollen at the extreme base of the segment. The hind cross vein is a little more erect than in *nigra*, but can be exactly matched in some specimens of *disjuncta*; it shows indications of the situation which is striking in some specimens of *nigra*. There are only two lateral pairs of scutellar bristles, instead of three as in the other species. The parafrontals, mesonotum, and scutellum are clothed with brownish pollen.

MICROPHTHALMA CUZCANA Townsend

Perua cuzcana TOWNSEND, Proc. U. S. Nat. Mus., vol. 43, 1912, p. 364.

Described from a single female taken by Dr. C. H. T. Townsend at Cuzco, Peru. The type is in the United States National Museum, and no additional material has been seen.

MICROPTHALMA RUFICEPS, new species

Male.—Front at the narrowest (just before ocelli) 0.24 and 0.27 of the head width (in the two specimens).

The whole front of the head, beginning a short distance from the ocelli and extending to the mouth and part way up the posterior orbit, is red in ground color overlaid with thin silvery pollen; no ocellar bristles; frontal bristles about seven, only the hindmost pair decussate and a little reclinate. Antennae red with only a very slight trace of infuscation at tip of third joint; second joint fully half the third; arista short, black, with only microscopic pubescence; palpi yellow, small; dorsum of thorax with dense gray pollen showing when viewed from behind a narrow black stripe each side between the acrostichals and the dorsocentrals, ending a little behind the suture, and a broader interrupted outer stripe, the part before the suture being triangular, the remainder extending almost to the scutellum. Scutellum with three lateral bristles, the middle one, however, rather small, and a large decussate apical pair.

Abdomen with broad pollinose hands of gray, the posterior third or more of the second and third segments subshining and in some lights with brown pollen; fourth segment gray pollinose to the middle, remainder shining; first segment without median marginals; second with one pair; third segment with marginal row of ten; fourth segment with irregular bristles, beginning a little before the middle, and an apical row considerably smaller. Genitalia brown. Legs black: claws and pulvilli enlarged; middle tibia with two bristles on outer front side; hind tibia with an irregular scattered row on outer hind side. Calypters white. Wings subhyaline, the veins yellowish red; hind cross vein and apical cross vein decidedly black. No distinct infuscation, even on the small cross vein. Third vein with about six small hairs at the base; the fourth vein ends in the costa considerably before the apex, its distance from extreme apex is fully equal to the costal segment between third and fourth veins.

Length, 8 mm.

Described from two males, collected by C. H. T. Townsend at Wild Horse Canyon, Animas Mountains, New Mexico; altitude 5,000 feet.

Type.—Male, Cat. No. 28862, U.S.N.M.

MICROPTHALMA VIRENS, new species

Female.—Front at vertex (narrowest part) 0.34 of the head-width (the same in two specimens). Parafrontals and parafacials densely covered with golden pollen which extends to the border of the mouth and covers the back of the head except the upper portion. First two joints of antennae red, the third joint black except the extreme base; second joint fully half as long as third; arista short,

bare; palpi yellow; beard yellow. Pollen of thorax and scutellum rather greenish, on the humeri yellowish-gray; the black stripes of the mesonotum are very distinct from all angles, the inner ones interrupted at the suture and extending only a short distance beyond it, the outer ones widely separated at the suture in two portions; the hindmost of these runs to a point as far back as the last intraalar. Scutellum with two lateral bristles and a large decussate apical pair.

The pollen of the abdomen is rather uniform, but thinner and darker along the hind edge of the segments, while at the anterior edge in some lights an indistinct paler crossband is barely evident; first segment without median marginals; second with one pair, large and erect; third with a large marginal row of eight; fourth with a somewhat irregular discal row of 8 or 10 and an apical row of the same number but smaller. Legs black, all the tibiae reddish in the middle, the middle ones with three bristles on the outer front side; the hind tibiae with two or three bristles on the outer hind side, the one at the middle rather strikingly elongated, equal to the longest one on the middle tibia.

Wings deep brown, fading out to some extent along the hind edge and apex, the hind cross vein and apical cross vein, however, quite strongly bordered; third vein with half a dozen bristles crowded together at the base. Calypters brown with narrow, yellow border. Length, 9 mm.

Described from two females collected by C. H. T. Townsend on Huascaray Ridge, Jaen Province, Peru; altitude 7,000 feet. Date of collecting, September 21 and 22.

Type.—Female, Cat. No. 28863, U.S.N.M.

DEXIOSOMA VIBRISSATUM Van der Wulp

Dexiosoma vibrissatum VAN DER WULP, *Biologia*, Dipt., vol. 2, 1891, p. 244, pl. 5, fig. 13.—GIGLIO-TOS, *Mem. Reale Accad. Sci. Torino*, ser. 2, vol. 44, 1893, p. 63.

Originally described from Tabasco, Mexico; Giglio-Tos reported it from Teapa and Tuxpango, Mexico. Townsend labelled the gray New Mexican form of *disjuncta* as *Microphthalma vibrissata*, but two specimens recently received of a widely different species seem to fit much better. These are females from Higuito, Costa Rica, collected by Pablo Schild. Unfortunately both have lost the third antennal joint, but the shortness of the second indicates that the third was probably more than three times the second, as Van der Wulp says. The first posterior cell opens much nearer the apex than in any of the species of *Microphthalma*, so that the distance between the tips of the second and third veins is more than twice that between the tip of third and the exact apex of the wing. According to Van der Wulp, the arista is densely plumose, which with the an-

tenal characters and venation agree with the genotype of *Dexiosoma*.

The face in profile is like Van der Wulp's figure, having a wide space between the vibrissa and the next bristle below. The wings are quite brown. The thoracic stripes agree with the description of *vibrissatum*; there is a narrow distinct stripe on each side, inside of the dorsocentral row, ending a little behind the suture, and outside the row there is a much wider and very conspicuous stripe extending almost to the scutellum.

Length, 6.6 and 7 mm., as compared with 10.5 given by Van der Wulp.

